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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/520,466	01/07/2005	Hirokatsu Hayashi	2005_0004A	5501

513 7590 03/17/2010

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EXAMINER	
MARTINEZ, BRITTANY M	

ART UNIT	PAPER NUMBER
1793	

NOTIFICATION DATE	DELIVERY MODE
03/17/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/520,466	HAYASHI ET AL.	
	Examiner	Art Unit	
	BRITTANY M. MARTINEZ	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 November 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 5-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 5-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Application

Applicants' arguments/remarks and amendments filed November 20, 2009, have been carefully considered. **Claims 1-3 and 5-12** are pending in the instant application, with **Claims 3 and 9** amended. **Claim 4** has been cancelled. **Claims 1-3 and 5-12** have been examined.

Claim Rejections - 35 USC § 102/103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. **Claim 1** is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Chevallier et al. (WO98/54090 (newly cited), using corresponding national stage entry, US 6,468,493 B1 (of record), for citation purposes).

4. With regard to **Claim 1**, Chevallier discloses an easily dispersible cake of precipitated silica, wherein the precipitated silica has a BET specific surface area of between 185 and 250 m^2/g (Chevallier, Comparative Example 1). While Chevallier

does not explicitly disclose wherein when ion-exchange water is added to the easily dispersible cake to provide an aqueous dispersion of the silica with a concentration of 5% by weight, said dispersion being stirred with a propeller mixer to affect a preliminary dispersion, a resultant slurry being treated to be dispersed with a high-pressure homogenizer once at a processing pressure of 78 MPa, and further being diluted to reduce the silica concentration to 1.5% by weight, a resultant dispersion having a light-scattering index (n-value) of at least 2, this limitation would be anticipated by Chevallier since Chevallier discloses the same easily dispersible cake of precipitated silica production process as the instant application. For a reference which neither expressly describes or teaches the subject matter alleged to be anticipated, the reference must provide enough information to permit an inference that the subject matter is inherent. *Ex parte Garvin*, 62 USPQ 2d 1680 (BPAI 2001). Chevallier discloses a process for producing an easily dispersible cake of precipitated silica comprising using an aqueous sodium silicate solution as an initial reaction liquid, simultaneously adding sodium silicate and sulfuric acid to said initial reaction liquid of which pH is being maintained at a fixed value of 8 +/-0.1, and of which temperature is being maintained at a temperature of 94°C, whereby forming precipitated silica; and separating said precipitated silica from said reaction liquid in a wet state, so as to obtain said easily dispersible cake of precipitated silica (Chevallier, Comparative Example 1). Since the process of Chevallier and that of the instant application (See **Claim 3**) are the same, the process of Chevallier would inherently produce the same product as that of the instant application. Accordingly, the burden shifts to Applicants to show that production of an easily

dispersible cake of precipitated silica wherein when ion-exchange water is added to the easily dispersible cake to provide an aqueous dispersion of the silica with a concentration of 5% by weight, said dispersion being stirred with a propeller mixer to affect a preliminary dispersion, a resultant slurry being treated to be dispersed with a high-pressure homogenizer once at a processing pressure of 78 MPa, and further being diluted to reduce the silica concentration to 1.5% by weight, a resultant dispersion having a light-scattering index (n-value) of at least 2 would not occur in the process of Chevallier.

5. Further, **Claim 1** does not require the limitations following "wherein when" in the 4th line of the claim; rather, these limitations are merely circumstantial. Since the process of Chevallier and that of the instant application are the same, the product of Chevallier would inherently have a light-scattering index (n-value) of at least 2 when ion-exchange water is added to the easily dispersible cake to provide an aqueous dispersion of the silica with a concentration of 5% by weight, said dispersion being stirred with a propeller mixer to affect a preliminary dispersion, a resultant slurry being treated to be dispersed with a high-pressure homogenizer once at a processing pressure of 78 MPa, and further being diluted to reduce the silica concentration to 1.5% by weight.

6. **Claim 1** is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over McKeown et al. (JP 05-208808 A) (newly cited).

7. With regard to **Claim 1**, McKeown discloses an easily dispersible cake of precipitated silica, wherein the precipitated silica has a BET specific surface area of between 100 and 450 m^2/g (McKeown, 0001; 0012; 0045-0048). While McKeown does not explicitly disclose wherein when ion-exchange water is added to the easily dispersible cake to provide an aqueous dispersion of the silica with a concentration of 5% by weight, said dispersion being stirred with a propeller mixer to affect a preliminary dispersion, a resultant slurry being treated to be dispersed with a high-pressure homogenizer once at a processing pressure of 78 MPa, and further being diluted to reduce the silica concentration to 1.5% by weight, a resultant dispersion having a light-scattering index (n-value) of at least 2, this limitation would be anticipated by McKeown since McKeown discloses the same easily dispersible cake of precipitated silica production process as the instant application. For a reference which neither expressly describes or teaches the subject matter alleged to be anticipated, the reference must provide enough information to permit an inference that the subject matter is inherent. *Ex parte Garvin*, 62 USPQ 2d 1680 (BPAI 2001). McKeown discloses a process for producing an easily dispersible cake of precipitated silica comprising using an aqueous sodium silicate solution as an initial reaction liquid, simultaneously adding sodium silicate and sulfuric acid to said initial reaction liquid of which pH is being maintained at a value between 8.5 and 10.5, and of which temperature is being maintained at a temperature of 98°C, whereby forming precipitated silica; and separating said precipitated silica from said reaction liquid in a wet state, so as to obtain said easily dispersible cake of precipitated silica (McKeown, 0045-0048; Table 1). Since the

process of McKeown and that of the instant application (See **Claim 3**) are the same, the process of McKeown would inherently produce the same product as that of the instant application. Accordingly, the burden shifts to Applicants to show that production of an easily dispersible cake of precipitated silica wherein when ion-exchange water is added to the easily dispersible cake to provide an aqueous dispersion of the silica with a concentration of 5% by weight, said dispersion being stirred with a propeller mixer to affect a preliminary dispersion, a resultant slurry being treated to be dispersed with a high-pressure homogenizer once at a processing pressure of 78 MPa, and further being diluted to reduce the silica concentration to 1.5% by weight, a resultant dispersion having a light-scattering index (n-value) of at least 2 would not occur in the process of McKeown.

8. Further, **Claim 1** does not require the limitations following "wherein when" in the 4th line of the claim; rather, these limitations are merely circumstantial. Since the process of McKeown and that of the instant application are the same, the product of McKeown would inherently have a light-scattering index (n-value) of at least 2 when ion-exchange water is added to the easily dispersible cake to provide an aqueous dispersion of the silica with a concentration of 5% by weight, said dispersion being stirred with a propeller mixer to affect a preliminary dispersion, a resultant slurry being treated to be dispersed with a high-pressure homogenizer once at a processing pressure of 78 MPa, and further being diluted to reduce the silica concentration to 1.5% by weight.

Claim Rejections - 35 USC § 103

9. **Claims 2 and 3** are rejected under 35 U.S.C. 103(a) as being unpatentable over Chevallier et al. (WO98/54090 (newly cited), using corresponding national stage entry, US 6,468,493 B1 (of record), for citation purposes) as applied to **Claim 1** above.

10. With regard to **Claim 3**, Chevallier discloses a process for producing an easily dispersible cake of precipitated silica comprising using an aqueous sodium silicate solution as an initial reaction liquid, simultaneously adding sodium silicate and sulfuric acid to said initial reaction liquid of which pH is being maintained at a fixed value of 8 +/- 0.1, and of which temperature is being maintained at a temperature of 94°C, whereby forming precipitated silica; and separating said precipitated silica from said reaction liquid in a wet state, so as to obtain said easily dispersible cake of precipitated silica (Chevallier, Comparative Example 1).

11. Chevallier does not disclose a water content within a range of 83-93% by weight (**Claim 2**); nor a concentration of solid silica in the reaction mixture at the end of the reaction not higher than 50 g/L (**Claim 3**).

12. With regard to **Claim 2**, an expected component amount is a result effective variable since one of ordinary skill in the art would expect different properties in the product as such amount varies. Since the component amount is a result effective variable, it is within the skill of one of ordinary skill in the art to develop a suitable water content. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

13. With regard to **Claim 3**, an expected component concentration is a result effective variable since one of ordinary skill in the art would expect different properties in

the process and resulting product as such amount varies. Since the component concentration is a result effective variable, it is within the skill of one of ordinary skill in the art to develop a suitable solid silica concentration in the reaction mixture at the end of the reaction. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

14. **Claims 2 and 3** are rejected under 35 U.S.C. 103(a) as being unpatentable over McKeown et al. (JP 05-208808 A) (newly cited) as applied to **Claim 1** above.

15. With regard to **Claim 3**, McKeown discloses a process for producing an easily dispersible cake of precipitated silica comprising using an aqueous sodium silicate solution as an initial reaction liquid, simultaneously adding sodium silicate and sulfuric acid to said initial reaction liquid of which pH is being maintained at a value between 8.5 and 10.5, and of which temperature is being maintained at a temperature of 98°C, whereby forming precipitated silica; and separating said precipitated silica from said reaction liquid in a wet state, so as to obtain said easily dispersible cake of precipitated silica (McKeown, 0045-0048; Table 1).

16. McKeown does not disclose a water content within a range of 83-93% by weight (**Claim 2**); nor a concentration of solid silica in the reaction mixture at the end of the reaction not higher than 50 g/L (**Claim 3**).

17. With regard to **Claim 2**, an expected component amount is a result effective variable since one of ordinary skill in the art would expect different properties in the product as such amount varies. Since the component amount is a result effective

variable, it is within the skill of one of ordinary skill in the art to develop a suitable water content. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

18. With regard to **Claim 3**, an expected component concentration is a result effective variable since one of ordinary skill in the art would expect different properties in the process and resulting product as such amount varies. Since the component concentration is a result effective variable, it is within the skill of one of ordinary skill in the art to develop a suitable solid silica concentration in the reaction mixture at the end of the reaction. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

19. **Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over Chevallier et al. (WO98/54090 (newly cited), using corresponding national stage entry, US 6,468,493 B1 (of record), for citation purposes) as applied to **Claim 1** above, and further in view of Alexander et al. (US 2,601,235) (of record).

20. With regard to **Claim 5**, Chevallier discloses a dispersion of precipitated silica comprising a dispersion of an easily dispersible cake in a polar solvent (Chevallier, Comparative Example 1).

21. Chevallier does not disclose an average particle size of precipitated silica particles present in the dispersion not greater than 300nm or a ratio of aggregated particles having a particle size equal to or more than 500 nm being not higher than 5% by volume (**Claim 5**).

22. With regard to **Claim 5**, Alexander discloses a dispersion of precipitated silica comprising a dispersion of an easily dispersible cake in a polar solvent, wherein the

average particle size of the precipitated silica particles present in said dispersion is in the range of 15 to 130 nanometers, with 93% of the particles having an average diameter in the range of from 18 to 63 nanometers (Alexander, c. 2, l. 1-13; c. 6, l. 38-73; c. 7, l. 1-8). Further, an expected particle size is a result effective variable since one of ordinary skill in the art would expect different properties in the product as such parameter varies. Since the particle size is a result effective variable, it is within the skill of one of ordinary skill in the art to develop a suitable average particle size of precipitated silica particles present in the dispersion. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

23. Further with regard to **Claim 5**, an expected ratio of particles of a certain size is a result effective variable since one of ordinary skill in the art would expect different properties in the product as such ratio varies. Since the ratio of particles of a certain size is a result effective variable, it is within the skill of one of ordinary skill in the art to develop a suitable ratio of aggregated particles having a particular particle size. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

24. Thus, it would have been obvious to one of ordinary skill in the art to modify the product of Chevallier with the particle size of Alexander in order to obtain a dispersion of precipitated silica useful as a reinforcing filler in rubber (Alexander, c. 1, l. 54-55).

25. **Claims 5 and 6** are rejected under 35 U.S.C. 103(a) as being unpatentable over McKeown et al. (JP 05-208808 A) (newly cited) as applied to **Claim 1** above, and further in view of Alexander et al. (US 2,601,235) (of record).

26. With regard to **Claim 5**, McKeown discloses a dispersion of precipitated silica comprising a dispersion of an easily dispersible cake in a polar solvent (McKeown, 0056).

27. With regard to **Claim 6**, McKeown discloses the dispersion further comprising a cationic polymer (McKeown, 0056).

28. McKeown does not disclose an average particle size of precipitated silica particles present in the dispersion not greater than 300nm or a ratio of aggregated particles having a particle size equal to or more than 500 nm being not higher than 5% by volume (**Claim 5**).

29. With regard to **Claim 5**, Alexander discloses a dispersion of precipitated silica comprising a dispersion of an easily dispersible cake in a polar solvent, wherein the average particle size of the precipitated silica particles present in said dispersion is in the range of 15 to 130 nanometers, with 93% of the particles having an average diameter in the range of from 18 to 63 nanometers (Alexander, c. 2, l. 1-13; c. 6, l. 38-73; c. 7, l. 1-8). Further, an expected particle size is a result effective variable since one of ordinary skill in the art would expect different properties in the product as such parameter varies. Since the particle size is a result effective variable, it is within the skill of one of ordinary skill in the art to develop a suitable average particle size of precipitated silica particles present in the dispersion. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

30. Further with regard to **Claim 5**, an expected ratio of particles of a certain size is a result effective variable since one of ordinary skill in the art would expect different

properties in the product as such ratio varies. Since the ratio of particles of a certain size is a result effective variable, it is within the skill of one of ordinary skill in the art to develop a suitable ratio of aggregated particles having a particular particle size. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

31. Thus, it would have been obvious to one of ordinary skill in the art to modify the product of McKeown with the particle size of Alexander in order to obtain a dispersion of precipitated silica useful as a reinforcing filler in rubber (Alexander, c. 1, l. 54-55).

32. **Claims 5 and 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Chevallier et al. (WO98/54090 (newly cited), using corresponding national stage entry, US 6,468,493 B1 (of record), for citation purposes) as applied to **Claim 1** above, and further in view of Hellring et al. (US 6,656,241 B1) (of record).

33. With regard to **Claims 5 and 7**, Chevallier discloses a dispersion of precipitated silica comprising a dispersion of an easily dispersible cake in a polar solvent (Chevallier, Comparative Example 1).

34. Chevallier does not disclose an average particle size of precipitated silica particles present in the dispersion not greater than 300nm or a ratio of aggregated particles having a particle size equal to or more than 500 nm being not higher than 5% by volume (**Claim 5**); nor a process for preparing a dispersion of precipitated silica comprising subjecting a silica slurry, formed by dispersing the cake of precipitated silica in a polar solvent, to a fine pulverization treatment with a high-pressure homogenizer (**Claim 7**).

35. With regard to **Claim 5**, Hellring discloses a dispersion of precipitated silica comprising a dispersion of an easily dispersible cake in a polar solvent, wherein the average particle size of the precipitated silica particles present in said dispersion is 29 nanometers (Hellring, c. 21, l. 11-25). Further, an expected particle size is a result effective variable since one of ordinary skill in the art would expect different properties in the product as such parameter varies. Since the particle size is a result effective variable, it is within the skill of one of ordinary skill in the art to develop a suitable average particle size of precipitated silica particles present in the dispersion. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

36. Further with regard to **Claim 5**, an expected ratio of particles of a certain size is a result effective variable since one of ordinary skill in the art would expect different properties in the product as such ratio varies. Since the ratio of particles of a certain size is a result effective variable, it is within the skill of one of ordinary skill in the art to develop a suitable ratio of aggregated particles having a particular particle size. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

37. With regard to **Claim 7**, Hellring discloses a process for preparing a dispersion of precipitated silica comprising subjecting a silica slurry, formed by dispersing the cake of precipitated silica in a polar solvent, to a fine pulverization treatment with a high-pressure homogenizer (Hellring, c. 4, l. 41-45; c. 18, l. 56-67; c. 19 - c. 24).

38. Thus, it would have been obvious to one of ordinary skill in the art to modify the product and process of Chevallier with the particle size and pulverization treatment of

Hellring in order to obtain a dispersion of precipitated silica suitable for polishing and chemical-mechanical planarization of substrates (Hellring, Abstract).

39. **Claims 5-7** are rejected under 35 U.S.C. 103(a) as being unpatentable over McKeown et al. (JP 05-208808 A) (newly cited) as applied to **Claim 1** above, and further in view of Hellring et al. (US 6,656,241 B1) (of record).

40. With regard to **Claims 5 and 7**, McKeown discloses a dispersion of precipitated silica comprising a dispersion of an easily dispersible cake in a polar solvent (McKeown, 0056).

41. With regard to **Claim 6**, McKeown discloses the dispersion further comprising a cationic polymer (McKeown, 0056).

42. McKeown does not disclose an average particle size of precipitated silica particles present in the dispersion not greater than 300nm or a ratio of aggregated particles having a particle size equal to or more than 500 nm being not higher than 5% by volume (**Claim 5**); nor a process for preparing a dispersion of precipitated silica comprising subjecting a silica slurry, formed by dispersing the cake of precipitated silica in a polar solvent, to a fine pulverization treatment with a high-pressure homogenizer (**Claim 7**).

43. With regard to **Claim 5**, Hellring discloses a dispersion of precipitated silica comprising a dispersion of an easily dispersible cake in a polar solvent, wherein the average particle size of the precipitated silica particles present in said dispersion is 29 nanometers (Hellring, c. 21, l. 11-25). Further, an expected particle size is a result

effective variable since one of ordinary skill in the art would expect different properties in the product as such parameter varies. Since the particle size is a result effective variable, it is within the skill of one of ordinary skill in the art to develop a suitable average particle size of precipitated silica particles present in the dispersion. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

44. Further with regard to **Claim 5**, an expected ratio of particles of a certain size is a result effective variable since one of ordinary skill in the art would expect different properties in the product as such ratio varies. Since the ratio of particles of a certain size is a result effective variable, it is within the skill of one of ordinary skill in the art to develop a suitable ratio of aggregated particles having a particular particle size. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

45. With regard to **Claim 7**, Hellring discloses a process for preparing a dispersion of precipitated silica comprising subjecting a silica slurry, formed by dispersing the cake of precipitated silica in a polar solvent, to a fine pulverization treatment with a high-pressure homogenizer (Hellring, c. 4, l. 41-45; c. 18, l. 56-67; c. 19 - c. 24).

46. Thus, it would have been obvious to one of ordinary skill in the art to modify the product and process of McKeown with the particle size and pulverization treatment of Hellring in order to obtain a dispersion of precipitated silica suitable for polishing and chemical-mechanical planarization of substrates (Hellring, Abstract).

47. **Claims 6-8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Chevallier et al. (WO98/54090 (newly cited), using corresponding national stage entry, US 6,468,493 B1 (of record), for citation purposes) in view of Alexander et al. (US 2,601,235) (of record) as applied to **Claim 5** above, and further in view of Kono et al. (US 6,417,264 B1) (of record).

48. With regard to **Claims 7 and 8**, Alexander discloses milling dispersions of precipitated silica in order to break-up agglomerates (Alexander, c. 6, l. 5-17).

49. The aforementioned applied art does not disclose a cationic polymer (**Claim 6**); a process for preparing a dispersion of precipitated silica comprising subjecting a silica slurry, formed by dispersing the cake of precipitated silica in the polar solvent, to a fine pulverization treatment with a high-pressure homogenizer (**Claim 7**); nor a process for preparing a dispersion of precipitated silica comprising subjecting a liquid premixture, formed by dispersing the cake of precipitated silica and the cationic polymer in the polar solvent, to a fine pulverization treatment with a high-pressure homogenizer (**Claim 8**).

50. With regard to **Claim 6**, Kono discloses a dispersion of precipitated silica which is characterized by being a dispersion of an easily dispersible cake of precipitated silica in a polar solvent, the average particle size of the precipitated silica particles present in the dispersion being not greater than 200 nm (Kono, c. 2, l. 8-11 and 59-67; c. 7, l. 16-17; "Table 1"), further comprising a cationic polymer (Kono, "Abstract;" c. 1, l. 6-7; c. 2, l. 8-11 and 52-58). Kono further discloses cationic polymer-modified silica dispersions exhibit enhanced optical density and water resistance when used as a coating liquid for ink-jet recording sheets (Kono, c. 1, l. 6-19). Thus, it would have been obvious to one of

ordinary skill in the art to modify the product of the aforementioned applied art with the cationic polymer of Kono in order to obtain a coating liquid for ink-jet recording sheets with enhanced optical density and water resistance.

51. With regard to **Claim 7**, Kono further discloses a process for preparing a dispersion of precipitated silica, in which a silica slurry formed by dispersing a cake of precipitated silica in a polar solvent is subjected to a fine pulverization treatment with a high pressure homogenizer (Kono, c. 4, l. 66-67; c. 5, l. 16-28, 42-48, and 66-67; c. 6, l. 1-3; c. 7, l. 21-24, 35-36, and 45-46; c. 8, l. 54-55). Thus, it would have been obvious to one of ordinary skill in the art to modify the process of the aforementioned applied art with the high-pressure homogenization of Kono because one of ordinary skill in the art could have pursued the known potential pulverization options within his or her technical grasp with a reasonable expectation of success.

52. With regard to **Claim 8**, Kono discloses a process for preparing a dispersion of precipitated silica, in which a liquid premixture formed by dispersing a cake of precipitated silica and cationic polymer in a polar solvent is subjected to a fine pulverization treatment with a high pressure homogenizer (Kono, c. 4, l. 66-67; c. 5, l. 16-28, 42-48, and 66-67; c. 6, l. 1-3; c. 7, l. 35-36 and 45-46; c. 8, l. 54-55). Thus, it would have been obvious to one of ordinary skill in the art to modify the process of the aforementioned applied art with the high-pressure homogenization of Kono because one of ordinary skill in the art could have pursued the known potential pulverization options within his or her technical grasp with a reasonable expectation of success.

53. **Claims 7 and 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over McKeown et al. (JP 05-208808 A) (newly cited) in view of Alexander et al. (US 2,601,235) (of record) as applied to **Claims 5 and 6** above, and further in view of Kono et al. (US 6,417,264 B1) (of record).

54. With regard to **Claims 7 and 8**, Alexander discloses milling dispersions of precipitated silica in order to break-up agglomerates (Alexander, c. 6, l. 5-17).

55. The aforementioned applied art does not disclose a process for preparing a dispersion of precipitated silica comprising subjecting a silica slurry, formed by dispersing the cake of precipitated silica in the polar solvent, to a fine pulverization treatment with a high-pressure homogenizer (**Claim 7**); nor a process for preparing a dispersion of precipitated silica comprising subjecting a liquid premixture, formed by dispersing the cake of precipitated silica and the cationic polymer in the polar solvent, to a fine pulverization treatment with a high-pressure homogenizer (**Claim 8**).

56. With regard to **Claim 7**, Kono further discloses a process for preparing a dispersion of precipitated silica, in which a silica slurry formed by dispersing a cake of precipitated silica in a polar solvent is subjected to a fine pulverization treatment with a high pressure homogenizer (Kono, c. 4, l. 66-67; c. 5, l. 16-28, 42-48, and 66-67; c. 6, l. 1-3; c. 7, l. 21-24, 35-36, and 45-46; c. 8, l. 54-55). Thus, it would have been obvious to one of ordinary skill in the art to modify the process of the aforementioned applied art with the high-pressure homogenization of Kono because one of ordinary skill in the art could have pursued the known potential pulverization options within his or her technical grasp with a reasonable expectation of success.

57. With regard to **Claim 8**, Kono discloses a process for preparing a dispersion of precipitated silica, in which a liquid premixture formed by dispersing a cake of precipitated silica and cationic polymer in a polar solvent is subjected to a fine pulverization treatment with a high pressure homogenizer (Kono, c. 4, l. 66-67; c. 5, l. 16-28, 42-48, and 66-67; c. 6, l. 1-3; c. 7, l. 35-36 and 45-46; c. 8, l. 54-55). Thus, it would have been obvious to one of ordinary skill in the art to modify the process of the aforementioned applied art with the high-pressure homogenization of Kono because one of ordinary skill in the art could have pursued the known potential pulverization options within his or her technical grasp with a reasonable expectation of success.

58. **Claims 6 and 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Chevallier et al. (WO98/54090 (newly cited), using corresponding national stage entry, US 6,468,493 B1 (of record), for citation purposes) in view of Hellring et al. (US 6,656,241 B1) (of record) as applied to **Claim 5** above, and further in view of Kono et al. (US 6,417,264 B1) (of record).

59. With regard to **Claim 8**, Hellring discloses a process for preparing a dispersion of precipitated silica comprising subjecting a silica slurry, formed by dispersing the cake of precipitated silica in a polar solvent, to a fine pulverization treatment with a high-pressure homogenizer (Hellring, c. 4, l. 41-45; c. 18, l. 56-67; c. 19 - c. 24).

60. The aforementioned applied art does not disclose a cationic polymer (**Claim 6**); nor a process for preparing a dispersion of precipitated silica comprising subjecting a liquid premixture, formed by dispersing the cake of precipitated silica and the cationic

polymer in the polar solvent, to a fine pulverization treatment with a high-pressure homogenizer (**Claim 8**).

61. With regard to **Claims 6 and 8**, Kono discloses a dispersion of precipitated silica which is characterized by being a dispersion of an easily dispersible cake of precipitated silica in a polar solvent, the average particle size of the precipitated silica particles present in the dispersion being not greater than 200 nm (Kono, c. 2, l. 8-11 and 59-67; c. 7, l. 16-17; "Table 1"), further comprising a cationic polymer (Kono, "Abstract;" c. 1, l. 6-7; c. 2, l. 8-11 and 52-58). Kono further discloses cationic polymer-modified silica dispersions exhibit enhanced optical density and water resistance when used as a coating liquid for ink-jet recording sheets (Kono, c. 1, l. 6-19). Thus, it would have been obvious to one of ordinary skill in the art to modify the product of the aforementioned applied art with the cationic polymer of Kono in order to obtain a coating liquid for ink-jet recording sheets with enhanced optical density and water resistance.

62. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over McKeown et al. (JP 05-208808 A) (newly cited) in view of Hellring et al. (US 6,656,241 B1) (of record) as applied to **Claims 5 and 6** above, and further in view of Kono et al. (US 6,417,264 B1) (of record).

63. With regard to **Claim 8**, Hellring discloses a process for preparing a dispersion of precipitated silica comprising subjecting a silica slurry, formed by dispersing the cake of precipitated silica in a polar solvent, to a fine pulverization treatment with a high-pressure homogenizer (Hellring, c. 4, l. 41-45; c. 18, l. 56-67; c. 19 - c. 24).

64. The aforementioned applied art does not disclose a process for preparing a dispersion of precipitated silica comprising subjecting a liquid premixture, formed by dispersing the cake of precipitated silica and the cationic polymer in the polar solvent, to a fine pulverization treatment with a high-pressure homogenizer (**Claim 8**).

65. With regard to **Claim 8**, Kono discloses a dispersion of precipitated silica which is characterized by being a dispersion of an easily dispersible cake of precipitated silica in a polar solvent, the average particle size of the precipitated silica particles present in the dispersion being not greater than 200 nm (Kono, c. 2, l. 8-11 and 59-67; c. 7, l. 16-17; "Table 1"), further comprising a cationic polymer (Kono, "Abstract;" c. 1, l. 6-7; c. 2, l. 8-11 and 52-58). Kono further discloses cationic polymer-modified silica dispersions exhibit enhanced optical density and water resistance when used as a coating liquid for ink-jet recording sheets (Kono, c. 1, l. 6-19). Thus, it would have been obvious to one of ordinary skill in the art to modify the product of the aforementioned applied art with the cationic polymer of Kono in order to obtain a coating liquid for ink-jet recording sheets with enhanced optical density and water resistance.

66. **Claims 9-12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Chevallier et al. (WO98/54090 (newly cited), using corresponding national stage entry, US 6,468,493 B1 (of record), for citation purposes) as applied to **Claim 1** above, and further in view of Kono et al. (US 6,417,264 B1) (of record) and Ichinose et al. (US 2003/0039808) (of record).

67. Chevallier does not disclose a coating liquid for ink-jet recording sheets which is obtained by dispersing the easily dispersible cake of precipitated silica of **Claim 1** and a binder in a polar solvent, wherein the percent transmission of the coating liquid, as measured after diluting the same to a silica concentration of 1.5% by weight being at least 20% (**Claim 9**); a cationic polymer (**Claim 10**); a process for making a coating liquid for ink-jet recording sheets comprising dispersing the cake of precipitated silica and a binder in the polar solvent (**Claim 11**); nor a process for making a coating liquid for ink-jet recording sheets comprising dispersing the cake of precipitated silica, the cationic polymer and a binder in the polar solvent (**Claim 12**).

68. With regard to **Claim 9**, Kono discloses a raw material for a coating liquid for ink-jet recording sheets (Kono, c. 1, l. 10-12) which is characterized by being obtained by dispersing an easily dispersible cake of precipitated silica in a polar solvent (Kono, c. 2, l. 8-11 and 59-67; c. 7, l. 16-17; "Table 1"), and the percent transmission of the raw material for the coating liquid as measured after diluting the same to the silica concentration of 1.5% by weight being at least 20% ("Table 1" and "Table 2"). Thus, it would have been obvious to one of ordinary skill in the art to modify the product of Chevallier with the coating liquid for an ink-jet recording sheet use of Kono because one of ordinary skill in the art could have pursued the known potential precipitated silica use options within his or her technical grasp with a reasonable expectation of success.

69. With regard to **Claim 10**, Kono discloses a raw material for a coating liquid for ink-jet recording sheet, which further comprises a cationic polymer (Kono, c. 1, l. 9-12). Kono further discloses cationic polymer-modified silica dispersions exhibit enhanced

optical density and water resistance when used as a coating liquid for ink-jet recording sheets (Kono, c. 1, l. 6-19). Thus, it would have been obvious to one of ordinary skill in the art to modify the product of Chevallier with the cationic polymer of Kono in order to obtain a coating liquid for ink-jet recording sheets with enhanced optical density and water resistance.

70. With regard to **Claim 11**, Kono discloses a process for making a raw material for a coating liquid for ink-jet recording, which is characterized by dispersing a cake of precipitated silica in a polar solvent (Kono, c. 2, l. 8-11 and 59-67; c. 7, l. 16-17; "Table 1").

71. With regard to **Claim 12**, Kono discloses a process for making a raw material for a coating liquid for ink-jet recording sheet, which is characterized by dispersing a cake of precipitated silica and a cationic polymer in a polar solvent (Kono, c. 4, l. 66-67; c. 5, l. 16-28, 42-48, and 66-67; c. 6, l. 1-3; c. 7, l. 35-36 and 45-46; c. 8, l. 54-55).

72. With regard to **Claims 9, 11 and 12**, Ichinose discloses a coating liquid for ink-jet recording sheets and a process of making, comprising dispersing silica, a binder, and a cationic polymer in a polar solvent (Ichinose, "Abstract;" p. 1, 0002; p. 2, 0025-0026; p. 6, 0059-0060).

73. Thus, it would have been obvious to one of ordinary skill in the art to modify the product and process of the aforementioned applied art with the binder of Ichinose in order to obtain an effective coating liquid for ink-jet recording sheets (Ichinose, "Abstract;" p. 1, 0002).

74. **Claims 9-12** are rejected under 35 U.S.C. 103(a) as being unpatentable over McKeown et al. (JP 05-208808 A) (newly cited) as applied to **Claim 1** above, and further in view of Kono et al. (US 6,417,264 B1) (of record) and Ichinose et al. (US 2003/0039808) (of record).

75. With regard to **Claim 10**, McKeown discloses the dispersion further comprising a cationic polymer (McKeown, 0056).

76. McKeown does not disclose a coating liquid for ink-jet recording sheets which is obtained by dispersing the easily dispersible cake of precipitated silica of **Claim 1** and a binder in a polar solvent, wherein the percent transmission of the coating liquid, as measured after diluting the same to a silica concentration of 1.5% by weight being at least 20% **(Claim 9)**; a process for making a coating liquid for ink-jet recording sheets comprising dispersing the cake of precipitated silica and a binder in the polar solvent **(Claim 11)**; nor a process for making a coating liquid for ink-jet recording sheets comprising dispersing the cake of precipitated silica, the cationic polymer and a binder in the polar solvent **(Claim 12)**.

77. With regard to **Claim 9**, Kono discloses a raw material for a coating liquid for ink-jet recording sheets (Kono, c. 1, l. 10-12) which is characterized by being obtained by dispersing an easily dispersible cake of precipitated silica in a polar solvent (Kono, c. 2, l. 8-11 and 59-67; c. 7, l. 16-17; "Table 1"), and the percent transmission of the raw material for the coating liquid as measured after diluting the same to the silica concentration of 1.5% by weight being at least 20% ("Table 1" and "Table 2"). Thus, it would have been obvious to one of ordinary skill in the art to modify the product of

McKeown with the coating liquid for an ink-jet recording sheet use of Kono because one of ordinary skill in the art could have pursued the known potential precipitated silica use options within his or her technical grasp with a reasonable expectation of success.

78. With regard to **Claim 10**, Kono discloses a raw material for a coating liquid for ink-jet recording sheet, which further comprises a cationic polymer (Kono, c. 1, l. 9-12). Kono further discloses cationic polymer-modified silica dispersions exhibit enhanced optical density and water resistance when used as a coating liquid for ink-jet recording sheets (Kono, c. 1, l. 6-19). Thus, it would have been obvious to one of ordinary skill in the art to modify the product of McKeown with the cationic polymer of Kono in order to obtain a coating liquid for ink-jet recording sheets with enhanced optical density and water resistance.

79. With regard to **Claim 11**, Kono discloses a process for making a raw material for a coating liquid for ink-jet recording, which is characterized by dispersing a cake of precipitated silica in a polar solvent (Kono, c. 2, l. 8-11 and 59-67; c. 7, l. 16-17; "Table 1").

80. With regard to **Claim 12**, Kono discloses a process for making a raw material for a coating liquid for ink-jet recording sheet, which is characterized by dispersing a cake of precipitated silica and a cationic polymer in a polar solvent (Kono, c. 4, l. 66-67; c. 5, l. 16-28, 42-48, and 66-67; c. 6, l. 1-3; c. 7, l. 35-36 and 45-46; c. 8, l. 54-55).

81. With regard to **Claims 9, 11 and 12**, Ichinose discloses a coating liquid for ink-jet recording sheets and a process of making, comprising dispersing silica, a binder, and a

cationic polymer in a polar solvent (Ichinose, "Abstract;" p. 1, 0002; p. 2, 0025-0026; p. 6, 0059-0060).

82. Thus, it would have been obvious to one of ordinary skill in the art to modify the product and process of the aforementioned applied art with the binder of Ichinose in order to obtain an effective coating liquid for ink-jet recording sheets (Ichinose, "Abstract;" p. 1, 0002).

Response to Amendments

Applicants' amendments filed November 20, 2009, with respect to the Claims have been fully considered and are accepted. The Claim objections and 35 U.S.C. 112 rejections of the previous Office action have been withdrawn.

Response to Arguments

Applicants' arguments filed November 20, 2009, with respect to the rejection of **Claims 1-3 and 5-12** over Persello, Blume, Alexander, and Hellring (Applicants' Response, 11/20/09, p. 6-11) have been fully considered and are persuasive to the extent that Blume, Alexander, and Hellring do not disclose the precipitated silica having a BET specific surface area of at least 220 m^2/g and while Persello discloses a BET specific surface area of 20 to 300 m^2/g generally, the Persello examples are limited to precipitated silica having a BET specific surface area of 200 m^2/g and below. This would suggest that the presence of colloidal silica in the initial reaction liquid of Persello does in fact affect the BET specific surface area of the precipitated silica. Therefore,

the corresponding rejections have been withdrawn. However, upon further consideration, new grounds of rejection have been made, as discussed above.

It is noted that Applicants' arguments that since Blume used an electrolyte in the initial reaction liquid (Applicants' Response, 11/20/09, p. 7) and Hellring used an acid in the initial reaction liquid (Applicants' Response, 11/20/09, p. 9-10), such references would not produce the precipitated silica of the instant invention are not convincing in of themselves. These arguments are only convincing to the extent that Blume and Hellring do not disclose the precipitated silica having a BET specific surface area of at least 220 m^2/g. Applicants point to page 11, lines 16-20 to show that electrolytes and acid in the initial reaction are disadvantageous; however, a review of said citation only shows that it is "preferred not to add a mineral acid before simultaneous addition of alkali silicate and mineral acid" (S. page 11, lines 21-23) (emphasis added) because such addition "tends to reduce the product's BET specific surface area" (S. page 11, lines 19-20). Thus, the instant application does not rule out the use of an electrolyte or acid in the initial reaction liquid, it merely indicates that doing so is not preferred since it tends to lower the BET specific surface area of the precipitated silica product. In cases where an electrolyte or acid is present in the initial reaction liquid and the resulting product has a BET specific surface area of at least 220 m^2/g, one would expect such product to be the same as that of the instant application.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRITTANY M. MARTINEZ whose telephone number is (571) 270-3586. The examiner can normally be reached Monday-Friday 9:00AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached at (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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